Drive bearing arrangement of rotating tools in printing machines

The present invention relates to a drive bearing arrangement of rotating tools in printing machines, specifically label printing machines, at the drive shaft, e.g., the drive shaft of a servomotor.

The present development in printing machines, specifically label printing machines, goes to no longer to drive the rotating tools of the various printing units through a central drive and gear wheels, chains or toothed belts, but to rather allocate to each separate tool such as e.g. printing cylinder, counter pressure cylinder, embossing and punching cylinder a own drive by means of a servo motor.

This leads to a printing machine of which the individual components of each printing unit can be exchanged very fast and in a simple way. Due to this a printing machine can be applied optimally.

Specifically at label printing machines, however, highest demands are made on the precise position of each tool, which especially due to the simple and fast exchanging possibilities poses highest demands on the interface of the change functions, namely the drive bearing arrangement between the one end of the tools and the drive shaft of the stationary mounted servomotor.

Object of the present invention has been to provide a drive bearing arrangement between a rotating tool and a drive shaft, which in consideration of a changing of tools can be disconnected very fast and possibly improves the precision of the bearing in comparison with

conventional solutions still more.

This object is solved at a drive bearing arrangement if the kind defined above in accordance with the invention by the features of the characterising portion of claim 1. Specific embodiments of the subject of the invention are defined in the independent claims.

Due to the design of the drive bearing arrangement in accordance with the present invention a geometrically optimal coupling between the tool and the drive for the rotating printing tools are provided which can be disconnected fast and easily, which allows a fast exchanging of tools.

The invention will be explained below with reference to the embodiments illustrated in the drawing somewhat more in detail. There is illustrated in:

Fig. 1 purely schematically a printing machine with a plurality of printing units and additional parts;

Fig. 2 a drive bearing in accordance with the invention, and

Fig. 3 a variant of the coupling cone.

In the figure Fig. 1 illustrates a modern printing machine of which the parts and printing units are driven electronically controlled through respective own servomotors. The printing machine includes a web reeling off unit 1, a conditioning unit 2, e.g. a screen printing device 3, a printing device 4, a plurality of further

printing units 5 - 9, a flex printing device 10 with a drying device 11, a supply part 12, a processing part 13 with punching device 14, reeling unit 15 and cutting unit 16, as well as a reeling unlit 7 as storage part, The individual units get enlisted depending from the order to be carried out.

The rotating tools can be exchanged fast in order to be available for new duties.

Fig. 2 illustrates how a rotating tool 18 is releasable but absolutely firmly connected or coupled, respectively, via an element 19 mounted thereto having a axial projecting connecting cone 20 to the drive shaft 21 of a servomotor 22 (illustrated schematically) (the other end of the tool 18 is held in a as such known manner in a bearing, e.g. a needle bearing which is located in a easily detachable not illustrated flange of a frame). The motor is also mounted to a flange 23 of the base frame of the unit.

The servomotor 22 serves e.g. as drive for a form cylinder, a counter pressure cylinder or as drive for a colouring apparatus.

After a extending or pivoting away, respectively, of the (not illustrated) frame flanges the tools (form cylinder, counter pressure cylinder, colouring apparatus) each of which being provided with coupling cone is inserted into the cone shaped recesses 24 of the drive shafts 21 and precisely centred therein. In order to have the tool sitting with the correct angular position on the drive shaft 21 a pin 25 is foreseen which holds the coupling cone 20 in the correct position (ads possibly also to

safeguard against rotating). The coupling proper proceeds by a frictional engagement between the surfaces of the cone 20 and the cone shaped recess 24 in that the coupling cone 20 is tightened by means of a tightening rod 26 (26') against the drive shaft 21 (by a tightening at the right hand side end, e.g., through a threaded drive).

The tightening rod (see Fig. 2) engages thereto a central undercut bore 27 of the cone 20 where a spreading head is located which can be extended to such an extent that the cone 20 is tightened and a optimal drive connection is provided. In order to release the drive connection or the drive bearing it is merely necessary to release the tightening rod 26 (with spreading head 28).

For a simple, fast releasing of the cone coupling it is possible to use a pressurized medium (e.g., pressurized air) via channels 29.

Fig. 3 of the drawing illustrates a variant of e element 19' with coupling cone 20' and undercut, central bore 27'.

This element 19' is suitable for an axial screwing onto a tool by means of several screws (Screw holes 30).